

ABSTRACT OF THE INVENTION

[059] A method and apparatus are provided for Raman imaging of carotenoids and related chemical substances in biological tissue, such as macular pigments. The method and apparatus utilize the technique of resonance Raman spectroscopy to produce an image of the levels of carotenoids and similar substances in tissue. In this technique, light is directed upon the area of tissue which is of interest such as the retina of an eye. A small fraction of the scattered light is scattered inelastically, producing a carotenoid Raman signal which is at a different frequency than the incident light. The Raman signal is collected, filtered, and analyzed to determine the spatial position and intensity of the Raman signals in the inelastically scattered light. An image of the Raman signals is then produced on an output device, with the image representing the spatial distribution and concentration level of carotenoids in the tissue.

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WORKMAN, NYDEGGER & SEELEY
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111